

**IMPORTATION OF *MATRICARIA RECUTITA* L.
(*MATRICARIA CHAMOMILLA* L.) (GERMAN CHAMOMILE)
AS FLOWERS AND LEAVES FROM EL SALVADOR,
GUATEMALA, HONDURAS, AND NICARAGUA
INTO THE CONTINENTAL UNITED STATES**

A Qualitative, Pathway-Initiated Risk Assessment

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March 30, 2001

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A. Introduction

This risk assessment (RA) was prepared for the Animal and Plant Health Inspection Service, (APHIS), U. S. Department of Agriculture (USDA) under Purchase Order Number 43-6395-0-2185 (dated June 27, 2000). The project was supported by the U. S. Agency for International Development under Project Hurricane Mitch Economic Initiative.

The purpose of this RA is to examine pest risks associated with the importation into the United States of flowers and leaves of *Matricaria recutita* L. (German chamomile) from El Salvador, Guatemala, Honduras, and Nicaragua. *Matricaria recutita* was formerly known as *Matricaria chamomilla* L. (Wiersema, and León, 1999) and is listed as *Matricaria chamomilla* in the Purchase Order for this RA.

The RA is a qualitative one in which risk is expressed in terms such as high and low rather than in numerical terms such as probabilities or frequencies. The details of the methodology and rating criteria can be found in: Pathway-Initiated Pest Risk Assessments: Guidelines for Qualitative Assessments, Version 5.0 (USDA, 2000a).

Regional and international plant protection organizations, *e.g.* North American Plant Protection Organization (NAPPO) and the International Plant Protection Convention (IPPC) administered by the Food and Agriculture Organization (FAO) of the United Nations provide guidance for conducting RAs. The methods used to initiate, conduct, and report this RA are consistent with guidelines provided by NAPPO and FAO. Our use of biological and phytosanitary terms conforms to the Definitions and Abbreviations (Introduction Section) in International Standards for Phytosanitary Measures, Section 1-Import Regulations: Guidelines for Pest Risk Analysis (FAO, 1996).

The FAO guidelines describe three stages of pest risk analysis: Stage 1 (initiation), Stage 2 (risk assessment), and Stage 3 (risk management). This document satisfies the requirements of FAO Stages 1 and 2.

B. Risk Assessment

1. Initiating Event: Proposed Action

This RA is commodity based and therefore “pathway-initiated.” It was conducted in response to a request for the USDA to authorize the importation of a particular commodity presenting a potential plant pest risk. The importation into the United States of German chamomile from El Salvador, Guatemala, Honduras, and Nicaragua is a potential pathway for the introduction of plant pests. The regulatory authority for the importation of fruits and vegetables may be found in the Code of Federal Regulations (7CFR§319.56).

2. Assessment of Weediness Potential of German Chamomile

The results of weediness screening for German chamomile as a commodity from El Salvador, Guatemala, Honduras, and Nicaragua (Table 1) did not prompt a pest-initiated risk assessment.

Table 1. Process for Determining Weediness Potential of the Commodity	
Commodity: Fresh flowers with leaves of <i>Matricaria recutita</i> L., for consumption.	
Phase 1: The species has a wide distribution in the United States.	
Phase 2: Is the species listed in:	
<u>YES</u>	Geographical Atlas of World Weeds (Holm <i>et al.</i> , 1979). The species has been reported as a serious weed in Afghanistan, England, Germany, Netherlands, and Poland; a principal weed in Austria, Belgium, France, Greece, Hungary, Italy, Spain, Sweden, and Tunisia; and a common weed in Canada, Egypt, Iraq, and the Soviet Union. It is present as a weed of unknown importance in 17 other countries, but not in the United States.
<u>NO</u>	World's Worst Weeds (Holm <i>et al.</i> , 1977).
<u>NO</u>	Report of the Technical Committee to Evaluate Noxious Weeds; Exotic Weeds for Federal Noxious Weed Act (Gunn and Ritchie, 1982).
<u>NO</u>	Economically Important Foreign Weeds (Reed, 1977). Two other species are listed as occurring in the Caucasus region, Russia, Iran, Afghanistan, and West Pakistan.
<u>YES</u>	Composite List of Weeds (Weed Science Society of America, 1989).
<u>YES</u>	World Weeds (Holm, <i>et al.</i> , 1997). The species has been reported as “a weed in Australia, New Zealand, several South American countries in the south temperate zone and behaves as a weed in most agricultural areas of the north temperate zone.”
<u>NO</u>	Is there any literature reference indicating weediness, <i>e.g.</i> , AGRICOLA, CAB, Biological Abstracts, and AGRIS search on "species name" combined with “weed”). Scentless chamomile, <i>M. perforata</i> Merat, has been reported as weedy in Canada (Bowes, <i>et al.</i> , 1994).
Phase 3: Conclusion: The species is widely grown as a crop in many countries and has been reported as a weed in the United States and elsewhere. In the United States, the species has been recorded in at least 27 states (USDA, 2000b) and the seed can be purchased in garden centers and other seed sources. Consequently, in spite of its listing as a weed, but not so under the Federal Noxious Weed Act (FNWA, 1974), the importation of leaves and flowers (even with seed contaminations) should not constitute a risk.	

3. Previous Risk Assessments, Current Status and Pest Interceptions

Previous risk assessments and decision history (APHIS, 2000a): There is no previous history.

Interceptions for FY 1985-99 (APHIS, 2000b): None

4. Pest Categorization

The pests that have been reported in the scientific and regulatory literature (as listed in the literature cited section) to infect or infest German chamomile in El Salvador, Guatemala, Honduras, and Nicaragua are recorded in Table 2. Table 2 also presents information about geographic distribution, host associations and regulatory data. Table 2 represents a "master list" of these organisms and serves as the basis for selecting pests for more detailed biological analysis.

Table 2. Pests associated with German chamomile from El Salvador, Guatemala, Honduras, and Nicaragua					
Pest Name (Order: Family)	Geographic Distribution ¹	Plant Part Affected ²	Quarantine Pest ³	Likely to Follow Pathway ³	References
ARTHROPODS					
<i>Diabrotica balteata</i> Leconte (Coleoptera:Chrysomelidae)	ES, GU, HO, NI, US	L	N	Y	Maes and Staines, 1991; McGuire and Crandall, 1967; Metcalf and Metcalf, 1993
<i>Cucullia artemisiae</i> (Hufnagel) ⁴ (Lepidoptera: Noctuidae)	HO	Fw	Y	Y	Arnett, 1985; Salgado- Cambar, 2000; Savela, 1999; Zhang, 1994
<i>Cucullia chamomillae</i> Denis and Schiffermuller ⁴ (Lepidoptera: Noctuidae)	HO	Fw	Y	Y	Arnett, 1985; Salgado- Cambar, 2000; Savela, 1999; Zhang, 1994
<i>Lygus lineolaris</i> (Palisot de Beauvois) (Heteroptera: Miridae)	HO, NI, US	L	N	Y	Maes and Carvalho, 1989; Passoa, 1983

Table 2. Pests associated with German chamomile from El Salvador, Guatemala, Honduras, and Nicaragua

Pest Name (Order: Family)	Geographic Distribution ¹	Plant Part Affected ²	Quarantine Pest ³	Likely to Follow Pathway ³	References
FUNGI					
<i>Erysiphe cichoracearum</i> DC (Pyrenomyces:Erysiphales)	HO, US	L	N	Y	ARS, 2000; Salgado- Cambar, 2000
<i>Peronospora leptosperma</i> de Bary ⁵ (Oomycetes: Peronosporales)	HO, US	L	N	Y	ARS, 2000; Salgado- Cambar, 2000

¹ES = El Salvador, GU = Guatemala, HO = Honduras, NI = Nicaragua, US = United States

²L = Leaves, Fw = Flowers

³Y = Yes, N = No

⁴Personal communication from Dr. Michael Pougé, Systematic Entomology Lab., USDA. Both *Cucullia* species are known only from Europe and Asia. The larvae are found primarily on the flowers of sagebush (*Artemisia* spp.).

⁵*Peronospora leptosperma* is listed here on the basis of correspondence from Sanidad Vegetal, Honduras (Salgado-Cambar, 2000), but it is not clear from the correspondence whether the fungus is discussed because it is an important pathogen of *Matricaria recutita* elsewhere or if it is present in Honduras. A literature search did not indicate that the agent was known to be a pathogen of chamomile in any of the four countries covered by this report or in Central America. The fungus is present in the U.S. (ARS, 2000), but not listed therein as a pathogen of chamomile. However, in the U.S. the fungus infects other species in the Asteraceae including *Artemisia* sp., *Artemisia biennis*, *Artemisia ludoviciana*, and *Chrysanthemum morifolium*. In Europe, the fungus infects *Matricaria chamomilla*, two other species of *Matricaria*, and two species of the closely related plant genus *Tripleurospermum* (ARS, 2000).

Any pest species listed in the above pest list that has a “Y” in the quarantine pest column is considered to be a quarantine pest of German chamomile from any of the four countries. Should any of these pests be intercepted in any shipments of flowers or leaves of the German chamomile, quarantine action will be taken. A non-quarantine pest is designated by “N.”

Only those quarantine pests that can reasonably be expected to follow the pathway in commercial shipments of leaves and stems of German chamomile were analyzed in detail. Only quarantine pests that have a “Y” in the “Likely to Follow Pathway” column and “Y” in the “Quarantine Pest” column were selected for further analysis in Tables 3, 4 and 5 (USDA, 2000a).

5. Consequences of Introduction

The two quarantine pests from Table 2 are in Table 3 for further analysis using the five risk elements (RE) described in Guidelines (USDA, 2000a)

Table 3. Risk Rating for Consequences of Introduction: Risk Elements						
Pest Species	RE #1 Climate/Host Interaction	RE #2 Host Range	RE #3 Dispersal Potential	RE #4 Economic Impact	RE #5 Environmental Impact	Cumulative Risk Rating
<i>Cucullia artemisiae</i>	Medium 2	Medium 2	Medium 2	Low 1	Low 1	Low 8
<i>Cucullia chamomillae</i>	Medium 2	Medium 2	Medium 2	Low 1	Low 1	Low 8

6. Likelihood of Introduction

The ratings for sub-elements (S-E) of risk assessment concerning “Likelihood for Introduction” of the pest listed in Table 3 is shown in Table 4.

Table 4. Risk Rating for Likelihood of Introduction							
Pest Species	S-E #1 Quantity imported annually	S-E #2 Survive postharvest treatment	S-E #3 Survive shipment	S-E #4 Not detected at port of entry	S-E #5 Moved to a suitable habitat	S-E #6 Contact with host material	Cumulative Risk Rating
<i>Cucullia artemisiae</i>	Medium 2	Medium 2	High 3	Low 1	Medium 2	High 3	Medium 13
<i>Cucullia chamomillae</i>	Medium 2	Medium 2	High 3	Low 1	Medium 2	High 3	Medium 13

7. Conclusion: Pest Risk Potential and Suggested Phytosanitary Measures

The pest risk potential rating for the pest listed in Tables 3 and 4 is shown in Table 5.

Table 5. Pest Risk Potential			
Pest Species	Consequences of introduction (Cumulative Risk Rating)	Likelihood of Introduction (Cumulative Risk Rating)	Pest Risk Potential
<i>Cucullia artemisiae</i>	Low 8	Medium 13	Medium 21
<i>Cucullia chamomillae</i>	Low 8	Medium 13	Medium 21

Pest Risk potential ratings have the following suggested meanings (USDA, 2000a).

Low: Pest will typically not require specific mitigation procedures. The port-of-entry inspection to which all imported commodities are subjected can be expected to provide sufficient phytosanitary security.

Medium: Specific phytosanitary measures may be necessary.

High: Specific phytosanitary measures are strongly recommended. Port-of-entry inspection is not considered sufficient to provide phytosanitary security.

A detailed examination and choice of appropriate sanitary and phytosanitary measures to mitigate pests risk for pests with particular pest risk potential scores or ratings is undertaken as part of the pest risk management phase and is not discussed in this document. The appropriate risk management strategy for a particular pest depends on the risk posed by that pest. APHIS risk management programs are risk based and their nature depends on the availability of appropriate methods.

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D. Acknowledgment

The authors gratefully acknowledge the external peer reviews made by the following entomologists or plant pathologists: John Lightfield, Robert Bellinger, Randy Griffin, Robert Goth, David Clement and Norm Leppla
